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| APPLICATION NO.   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO.               | CONFIRMATION NO. |
|---|-------------|----------------------|-----------------------------------|------------------|
| 10/816,892  | 04/05/2004  | Tadayuki Hatsuda     | NS-US045036                       | 4032             |
| 22919   | 7590        | 03/08/2006           |                                   |                  |
| SHINJYU GLOBAL IP COUNSELORS, LLP<br>1233 20TH STREET, NW, SUITE 700<br>WASHINGTON, DC 20036-2680 |             |                      | EXAMINER<br>BOTTORFF, CHRISTOPHER |                  |
|   |             |                      | ART UNIT                          | PAPER NUMBER     |
|   |             |                      | 3618                              |                  |
| DATE MAILED: 03/08/2006   |             |                      |                                   |                  |

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |   |                                       |  |
|------------------------------|---|---------------------------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/816,892    | <b>Applicant(s)</b><br>HATSUDA ET AL. |  |
|                              | <b>Examiner</b><br>Christopher Bottorff | <b>Art Unit</b><br>3618               |  |

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 14 February 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 4-7,9,11 and 20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3,8 and 15-19 is/are rejected.
- 7) ☒ Claim(s) 10 and 12-14 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>4/20/04</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Election/Restrictions***

Applicant's election without traverse of invention I, species 1 and a, directed to the apparatus of related to Figures 1, 2, and 5, in the reply filed on February 14, 2006 is acknowledged.

Claims 4-7, 9, 11, and 20 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to nonelected species and a nonelected invention, there being no allowable generic or linking claim. Although Applicants did not indicate that claim 6 was withdrawn, claim 6 has been withdrawn since the controller configuration related to inverter drive frequency and wheel speed is directed toward the non-elected species depicted in Figure 10 and described on pages 22-25 of the specification. Claims 1-3, 8, 10, and 12-19 have been considered.

### ***Priority***

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Information Disclosure Statement***

The information disclosure statement (IDS) submitted on April 20, 2004 was considered by the examiner.

***Claim Objections***

Claim 15 is objected to because of the following informalities: the term "until" on line 3 after "a control" should be "unit". Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 8, and 19 are rejected under 35 U.S.C. 102(e) as being anticipated by Brandon et al. US 6,717,281.

Brandon et al. disclose a drive apparatus comprising a first drive unit and a second drive unit. See Figure 5. The first drive unit includes at least a first non-permanent magnet electric motor, in the form of a switched reluctance motor 20, configured and arranged to drive a first wheel 30. The first drive unit further includes a first reduction gear 22 operatively coupled to the first non-permanent magnet electric motor 20 to reduce speed of the first non-permanent magnet electric motor 20. The second drive unit includes at least a second non-permanent magnet electric motor, in the form of a switched reluctance motor 21, configured and arranged to drive a second wheel 32 disposed on an opposite side of the vehicle from the first wheel 30. The

second drive unit further includes a second reduction gear 22 operatively coupled to the second non-permanent magnet electric motor 21 to reduce speed of the second non-permanent magnet electric motor 21.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Brandon et al. US 6,717,281 in view of Kawamoto et al. US 5,382,854.

Brandon et al. do not disclose that the drive units are each housed substantially within the rim of the corresponding wheel. However, Kawamoto et al. teach the desirability of housing a drive unit 24, 31 substantially within a wheel rim 45. See Figure 1. From the teachings of Kawamoto et al., housing each drive unit of Brandon et al. in the rim of the corresponding wheel would have been obvious to one of ordinary skill in the art at the time the invention was made. This would provide a more compact arrangement that efficiently utilizes space within the apparatus.

Claims 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brandon et al. US 6,717,281 in view of Ohba et al. US 6,449,552.

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Brandon et al. disclose third 50 and fourth 51 wheels, an internal combustion engine power source 18, a generator 16 mechanically coupled to the internal combustion engine and electrically coupled to the first and second electric motors 20, 21, and a control unit 44. See Figures 5 and 7-9 and column 7, line 54, through column 12, line 31. Brandon et al. do not disclose that the internal combustion engine is configured and arranged to drive the third and fourth wheels and that the control unit is configured to selectively switch between a four wheel drive mode and a two wheel drive mode. However, Ohba et al. teach the desirability of configuring and arranging an internal combustion engine 14 to drive third 66 and fourth 68 wheels and configuring a control unit 100, 102, 104, 106, 108 to selectively switch between a four wheel drive mode and a two wheel drive mode. See Figure 2; column 5, lines 22-31; and column 7, line 58, through column 8, line 6. From the teachings of Ohba et al., configuring and arranging the internal combustion engine of Brandon et al. to drive the third and fourth wheels and configuring the control unit of Brandon et al. to selectively switch between a four wheel drive mode and a two wheel drive mode would have been obvious to one of ordinary skill in the art at the time the invention was made. This would allow for improved control of the vehicle by allowing power to be distribution between the wheels numerous ways.

Claims 1, 3, 8, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schmitz et al. US 6,622,804 in view of Brandon et al. US 6,717,281.

Schmitz et al. disclose a drive apparatus comprising a first drive unit and a second drive unit. See Figure 1. The first drive unit includes a first electric motor 50 configured and arranged to drive a first wheel 13. The first drive unit further includes a first reduction gear 52 operatively coupled to the first electric motor 50 to reduce speed of the first electric motor 50. See Figures 1 and 3. The second drive unit includes a second electric motor 60 configured and arranged to drive a second wheel 14 disposed on an opposite side of the vehicle from the first wheel 13. The second drive unit further includes a second reduction gear 62 operatively coupled to the second electric motor 60 to reduce speed of the second electric motor 60. See Figures 1 and 3.

First and second inverters 54, 64 are configured and arranged to supply electrical power separately to the first and second electric motors 50, 60, respectively. See Figure 3. Also, a driven wheel drive controller 200 is configured to control the first and second inverters 54, 64 to separately control a torque of each of the first and second electric motors 50, 60. See column 5, lines 12-54.

Schmitz et al. do not utilize non-permanent magnet, switched reluctance, electric motors. However, Brandon et al. teach the desirability of utilizing non-permanent magnet, switched reluctance, electric motors in a drive apparatus. See column 5, lines 42-61. From the teachings of Brandon et al., utilizing non-permanent magnet, switched reluctance, electric motors as the first and second electric motors of Schmitz et al. would have been obvious to one of ordinary skill in the art at the time the invention was made. This would decrease the size and cost of the motors.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schmitz et al. US 6,622,804 in view of Brandon et al. US 6,717,281 as applied to claim 1 above, and further in view of Kawamoto et al. US 5,382,854.

Schmitz et al. do not disclose that the drive units are each housed substantially within the rim of the corresponding wheel. However, Kawamoto et al. teach the desirability of housing a drive unit 24, 31 substantially within a wheel rim 45. See Figure 1. From the teachings of Kawamoto et al., housing each drive unit of Schmitz et al. in the rim of the corresponding wheel would have been obvious to one of ordinary skill in the art at the time the invention was made. This would provide a more compact arrangement that efficiently utilizes space within the apparatus.

Claims 15-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schmitz et al. US 6,622,804 in view of Brandon et al. US 6,717,281 as applied to claim 1 above, and further in view of Ohba et al. US 6,449,552.

Schmitz et al. disclose third 11 and fourth 12 wheels, an internal combustion engine power source 300, and a generator 310 mechanically coupled to the internal combustion engine and electrically coupled to the first and second electric motors 50, 60. See Figure 1. Schmitz et al. also disclose that the third and fourth wheels may be driven. See column 1, lines 32-33. Schmitz et al. do not disclose how the third and fourth wheels may be driven and that the control unit is configured to selectively switch between a four wheel drive mode and a two wheel drive mode. However, Ohba et al. teach the desirability of configuring and arranging an internal combustion engine 14 to



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drive third 66 and fourth 68 wheels and configuring a control unit 100, 102, 104, 106, 108 to selectively switch between a four wheel drive mode and a two wheel drive mode. See Figure 2; column 5, lines 22-31; and column 7, line 58, through column 8, line 6. From the teachings of Ohba et al., configuring and arranging the internal combustion engine of Schmitz et al. to drive the third and fourth wheels and configuring the control unit of Schmitz et al. to selectively switch between a four wheel drive mode and a two wheel drive mode would have been obvious to one of ordinary skill in the art at the time the invention was made. This would allow for improved control of the vehicle by allowing power to be distribution between the wheels numerous ways.

In regard to claim 19, the recitation of a vehicle including a pair of primary drive wheels and a pair of driven wheels is expressed as the intended use for the drive apparatus. However, mere intended use does not limit the invention or distinguish over the prior art, as described above in view of Brandon et al. alone and Schmitz et al. in view of Brandon et al. In the event that the vehicle including a pair of primary drive wheels and a pair of driven wheels were positively recited in a manner that limits the invention, the invention still would not distinguish over Schmitz et al. in view of Brandon et al. and Ohba et al. since Ohba teaches such a vehicle. See Figure 2.

### ***Allowable Subject Matter***

Claims 10 and 12-14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The prior art does not teach or

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suggest, in combination with the further limitations of the claims, a controller structured to operate as required by claims 10 and 14.

### ***Conclusion***

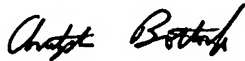
The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Hender, Nowick, Gingerich, Deguchi et al., Schmitz et al. US 6,573,675, Kima et al. US 6,688,412, Kima et al. US 20020023791, and Morrow et al. disclose drive systems. Harris teaches that switched reluctance electric motors are non-permanent magnet electric motors. See column 1, lines 34-39. Niwa et al. teach the desirability of using ceramic bearings in a ball bearing system. See paragraph 0002, lines 3-4.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher Bottorff whose telephone number is (571) 272-6692. The examiner can normally be reached on Mon.-Fri. 7:30 a.m. - 4:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chris Ellis can be reached on (571) 272-6914. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read "Christopher Bottorff".

Christopher Bottorff